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ABSTRACT

This paper pursues three themes for understanding the nature of teaching and learning: (1) the mechanisms involved in teaching and learning as they occur in their normal context; (2) the processes and effects of a change whereby teachers and students assume greater personal awareness; and (3) the processes for facilitating change. Discussion centers around certain assumptions: (1) episodes of teaching and learning are each a singular process of development of personal intellectual competence and performance; (2) the mechanisms of interaction of the different components of intellectual competence and performance must be understood; (3) the notion of constructivism holds for all components of intellectual competence, and enhances understanding of the nature of intellectual performance; (4) enhanced metacognition is a principal goal of education and a focus for fostering intellectual development; (5) because of the complex and personal nature of change through intellectual development, progress requires that the teacher and learner participate actively in research; (6) this research should be based on reflection, and should be directed to constructing a pluralistic, relativistic epistemology; and (7) collaborative research fosters intellectual development through reflection on practice. (JD)

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INTELLECTUAL AND METHODOLOGICAL IMPERATIVES FOR INDIVIDUAL TEACHER DEVELOPMENT

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INTRODUCTION: GENERAL STRUCTURE OF THE SYMPOSIUM 'CONSTRUCTIVIST PERSPECTIVES ON INDIVIDUAL TEACHER DEVELOPMENT'

According to the AERA prescription, a symposium should present 'specific problems or topics from a variety of perspectives ..[by providing] .. alternative solutions, interpretations or contrasting points of view .. in relation to a common theme'. In this symposium, each presentation pertains to the general topic of enhancing understanding of the nature of teaching and learning as expressed by the following three aims:

1. Teachers and Teaching: Learners and Learning
   (a) To know more about what it is to be a teacher and a learner.
   (b) To explore the mechanisms involved in teaching and learning as they occur in their normal context.
2. Change
   (a) To know more about the processes by which individuals change with experience. In particular, to consider the influence of content and context on individual change.
   (b) To explore the processes and effects of a change whereby teachers and students assume greater personal awareness, responsibility and control over their practice.
3. Facilitating Change
   To know more about appropriate and productive research methodologies for exploring aim 1 and facilitating aim 2.

A general theme underpins these presentations. This theme is the constructivist nature of individual change, particularly as relates to teachers as they develop expertise in their teaching.

In this paper, I shall present seven assertions which bear on the pursuit of these three aims. These assertions incorporate various intellectual and methodological imperatives for the design and implementation of practices which guide progress towards the aims. The assertions will serve as a structure for consideration of the implications of the results to be reported in Presentations 2-4.

Presentations 2-4 are a blend of similarities and differences. The preeminent similarity among them is the extent to which they highlight an integrative perspective (Gunstone and Baird, 1988) for conceptualising teachers, teaching, and research on teaching. This integrative perspective arises from several interrelated bases which will be mentioned now and elaborated later. These bases serve to:

1. balance the specific and the general, and the singular and the multiple (particularly through taking a holistic approach to the study of individuals and their teaching);
2. draw together perspectives on constructivism, metacognition, and the nature of individual change;
3. recognise the interdependence of educational research and practice.

The integrative perspective is elaborated by means of the seven assertions.

The major differences among the different presentations relate mainly to their different purposes and contexts. Presentations 2 and 3 concern preservice teacher education. Findings involving teacher educators and teachers in training will be considered in relation to

the coursework (Presentation 2) and the practicum (Presentation 3) aspects of teacher development. Presentation 4 centres on the induction and in-service phases of teacher education, and reports research by novice and experienced teachers.

THE ASSERTIONS

Assertion 1. Each of teaching and learning is a singular process of development of personal intellectual competence and performance

The tension between the specific and the general, and the singular and the multiple, underlies this assertion. If, as is currently recognised, each teaching or learning episode is unique, which aspects of the episode dictate its uniqueness? Alternatively, which aspects of particular teaching or learning episodes characterise teaching or learning in their generic sense? There is no doubt that some form of generalisation, across content, context and time, is necessary for improvement of practice both for an individual, and among different individuals.

It is now acknowledged widely that the thoughts and actions of the individual teacher or learner are prime determinants of the progress and outcomes of a teaching or learning episode. Thus, understanding of much of what is teaching or learning will only derive from study of individuals. However, this seemingly unitary, atomistic focus may be misleading. To transfer research attention from a group or population to an individual is not to be reductionist. Indeed, it appears that a holistic orientation is productive for study of individuals as they learn or teach (or learn by teaching!). A holistic orientation allows adequate account to be taken of the multiple factors which act to influence the thoughts and actions of these individuals.

Two terms which accommodate this multiplicity of influence will now be introduced. These terms are intellectual competence and intellectual performance (Baird, 1988). Intellectual competence comprises four major cognitive and affective components: Attitudinal traits (including Values and Concerns); Perceptual traits (including Expectations); Conceptions (including Theories and Beliefs); Abilities. One major determinant of the uniqueness of a teaching or learning episode is the uniqueness of each of the components of the individual's intellectual competence at the time of the episode. For the teaching of, say, Year 10 Electrical Energy, a person has attitudes, perceptions, conceptions, and abilities with respect to the subject-matter, pedagogical, and curricular aspects of the topic. Some examples of the different component of intellectual competence with respect to this topic are given in Table 1. Obviously, each of these components influence one another. They also interact with more general attitudes, perceptions, conceptions, and abilities regarding teaching and learning.

A person's intellectual competence will influence, and be manifested as, subsequent intellectual performance as he or she plans or teaches a lesson on electrical energy. By intellectual performance is meant the person's Attitudinal states (expressed verbally or non-verbally), Perceptions (e.g. awareness of the extent of student understanding, or development of the lesson in terms of prior intentions), and Decisions and Behaviours about what to do and why, as the lesson proceeds.

Figure 1. Examples of components of intellectual competence which relate to the teaching of Year 10 Electrical Energy

	Aspect of the topic of Electric Energy		
Component of intellectual competence	Subject-matter	Pedagogical	Curricular
Attitudes (including values, concerns)	Attitudes and concerns regarding the use and conservation of electrical energy	Personal concerns about teaching the topic	Attitudes regarding appropriateness of particular curriculum materials for teaching it
Perceptions (including expectations)	Wires heat up when electricity runs through them. Visible effects of lighting and thunder storms	Students' interest and application is enhanced when they discover the manner of operation of ammeters	Students tend to ignore printed materials which lack simple diagrams
Conceptions (including theories, beliefs)	Notions of the nature of electrical energy	Knowledge about how much students know about the topic at different year levels	Knowledge about how the topic is treated in particular student texts.
Abilities	Ability to construct an electric circuit	Ability to explain clearly to year 10 students the difference between current and energy	Ability to select the most useful student text, based on appropriate criteria

Assertion 2. Understanding the nature and process of teaching and learning requires understanding of the mechanisms of interaction of the different components of intellectual competence and performance

In this assertion, ideas introduced in assertion 1 are developed. Teaching and learning usually involve the teacher or learner in a complex process of intellectual development. Research directed to understanding more about teaching and learning must acknowledge and embrace this complexity. The research should seek to integrate the many factors which influence the nature and progress of these processes. The research itself should also be integrated in terms of its purposes, focuses, and methods.

For each of teaching, learning, and research on teaching and learning, enhanced understanding requires that four elements be resolved. These elements are 'What', 'Why''Why', 'How' and 'How Well' (see Table 1).

Table 1: The 'What', 'Why', 'How' and 'How Well' of teaching, learning and research

	Teaching and learning	Research on teaching and learning
'What'	Classroom content; observed activities and behaviours (i.e. What is being taught; What happens in the classroom)	The research focuses
'Why'	Decisions made, and reasons for these decisions (i.e. Why this topic is being done; why participants act as they do)	The research purposes
'How'	The processes of teaching and learning and their underlying mechanisms (i.e. How teachers teach; How learners learn)	The research methods
'How Well'	The standards of teaching and learning (i.e. How 'successful' (=effective); How 'good' (= morally defensible, extent of worth or quality)	The research standards

The word 'resolve' is used in the preceding sentence quite deliberately, as some meanings of this word help elucidate the nature of the endeavour. Of fourteen common meanings of this word (see Figure 1), eight pertain to this argument - five positively and three negatively.

Figure 1: Meanings of the word 'resolve' (from Collins Dictionary of the English Language. Australian edition, edited by G.A. Wilkes, 1979)

The nature of the desired research is to:

(a) clearly distinguish the four elements for each of teaching and learning, and research on teaching and learning (meaning number 3);

(b) determine the importance of each of these elements, and some patterns of interaction among them (meaning number 1);

(c) formulate an opinion, based on these findings, regarding appropriate action to facilitate productive interactions among them (meaning number 2);

(d) generate a more productive ('harmonious') integration of the four elements (meaning number 10), which will

(e) improve the quality of thought and action, theory and practice, process and outcome (meaning number 4).

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However, these processes are sufficiently complex that:

(f) it is unlikely that they are determined by laws or rules which have universal validity. Therefore, it is premature to seek universal solutions (meaning number 6);

(g) the intention is the antithesis of explaining away or dispelling the influence of the four elements (meaning number 7); rather, it is to centre attention on them and their importance for successful teaching and learning;

(h) our understandings of them remain embryonic and tentative; again, a position which is the antithesis of bringing to an end, or concluding (meaning number 8).

In each of the above four elements, a crucial fifth element is implied but not acknowledged directly. It comprises the participants themselves in their current personal, physical, and social context. This fifth element therefore is 'Who/When/Where'. It is central to a constructivist perspective of learning and, according to this perspective, is the basis for resolving the other four elements. 'Who/When/Where' encompasses the various components of an individual's intellectual competence (see above), and the manner in which these components interact with contextual factors to determine intellectual performance. For instance, decisions are made regarding the 'What' and 'How' of teaching, learning, or researching, where the reasons for the decisions made ('Why') are the result of an interaction between the individuals and the context in which the decisions are made. These decisions then determine the outcome ('How Well').

Assertion 3. The notion of constructivism holds for each of the components of intellectual competence, and enhances understanding of the nature of intellectual performance

Here, I assert that it is important to maintain a general view of constructivism when attempting to understand and explain the nature and progress of teaching and learning. According to this perspective, individuals already hold a range of attitudes, perceptions, conceptions, and abilities in relation to teaching and learning. An individual learns by actively processing incoming information in terms of these existing constructs and attributes. Effective teaching provides the learner with opportunities to build on or reconstruct these constructs and attributes.

Thus, the notion of constructivism is as relevant to each of the other components of intellectual competence as it is to subject-based conceptions, which have been the focus of much recent research. Constructivism is particularly powerful for seeking to explain the mechanisms of interaction between and among the various components of intellectual competence and performance.

The notion of constructivism is central to each of the remaining assertions.

Assertion 4. Enhanced metacognition is a principal goal of education, and is a productive focus for fostering intellectual development

One important notion for promoting an integrative approach to the study of teaching and learning is that of metacognition (e.g. Brown and Palincsar, 1982). As it relates to learning, adequate metacognition would comprise knowledge about the nature of learning, particular learning strategies, and one's own learning habits, awareness and

monitoring of the nature, purpose and progress of the current learning task (ie what you are doing and why you are doing it), and control of learning through informed, productive decision-making. An analogous combination of knowledge, awareness and control elements would characterise metacognition in relation to teaching. As thus defined, metacognition subsumes the conceptions and abilities components of intellectual competence, and the perceptions, decisions, and behaviours components of intellectual performance.

Enhanced metacognition is a principal goal of education as it is an attribute of the effective, independent learner - a person who takes responsibility for personal learning, both in school and in later life.

There is an obvious complementary between constructivism and metacognition - adequate metacognition empowers the learner to effectively undertake the constructivist process of recognition, evaluation, and possible reconstruction of personal views and abilities.

Assertion 5. Because of the complex and personal nature of change through intellectual development, progress towards the three aims in the introduction requires that the teacher and learner participate actively in the research

It follows from the first four assertions that intellectual development is often complex and demanding and, as a result, personally unsettling. Research on conceptual change (e.g. Gunstone, 1988) and on enhancement of metacognitive proficiency (e.g. Baird, 1986), when taken together with more general understandings of the nature of personal change (e.g. Calderhead, 1988; Fullan, 1982) all indicate the necessity for adequate time, effort, and support in order that such change occur.

The complexity and singular nature of individual development have direct implications for how it should be researched. Important contributors to research on the cognitive and the affective, the overt and the covert, behaviours and their mechanisms, effects and their causes, observations and explanations must be the teachers and learners themselves. These contributors, through careful reflection on themselves and their practice, can help protect the validity of the findings from errors of interpretation or inference. The importance of personal reflection for supporting both individual change and research on change will be argued in assertion 6. A method for providing appropriate support for this reflection is outlined in assertion 7.

Assertion 6. This research should be based on reflection, and should be directed to constructing a pluralistic, relativistic epistemology. To this end, the reflection should be of two types: reflection on particulars of practice; phenomenological reflection

Recognition of the complex nature of the intellectual development inherent in teaching and learning requires that one aspect of such development be considered further.

Certain conceptualisations of oneself and of the nature of teaching and learning predispose to personal change and development of understanding, and some do not. For instance, a person who holds a monistic, absolutist epistemology (e.g. who believes that there is always only one valid, invariant reason for, or explanation of, an educational phenomenon) would need to undergo change as progress towards a more pluralistic, relativist position (Note 1). As do many of the constructivist processes involved in intellectual development, this process of change will involve intensive personal and professional reflection.

The nature of the desired intellectual development indicates that such development may be fostered through two types of reflection. The first type is the reflection on classroom practice which Schon (1983) would describe as reflection - in - action. The second type is phenomenological reflection, in which the person draws from personal experience those 'essences' which, for him or her, seem to characterise teaching and learning. Both types of reflection will stimulate the person to develop by generating new insights, and constructing new meanings.

Assertion 7. Collaborative action research is a method which fosters intellectual development through reflection on practice. One measure of change is the extent to which participants accept certain responsibilities necessary for maintenance of the research

One means of providing opportunities and support for teachers undergoing regular reflection on practice is through the method of Collaborative Action Research (Baird, Mitchell, and Northfield, 1987). By this method, teachers (or students) and consultants enter into a shared, intensive, long-term process of change and development. The two types of participant (teachers, consultants) bring to the group different perspectives and expertise. Through regular discussion and meetings, group members generate together tentative principles of theory and practice which possess face validity from both perspectives. Decisions are made regarding action to be taken, the participants attempt to translate principles into practice, and they document and reflect on outcomes. Findings are often brought back to the group for consideration, and the cycle begins again. This style of research sets practice beside theory in order to foster the coordinated development of both. It balances the pressure for change with appropriate support. The pressure relates to personal goals and aspirations

regarding enhanced intellectual competence and performance. The support comes from the sharing of the endeavour in the others. Overall, collaborative research offers many benefits for those seeking relevant theory and sound practice (e.g. Bolster, 1983; Kyle and McCutcheon, 1984; Watt and Watt, 1982).

In order that collaborative action research endures, group members must accept various necessary responsibilities for dealing with the different needs which arise. These responsibilities vary in nature from organisational and administrative (e.g. arranging and organising meeting times and agenda) to providing conceptual guidance to other group members (e.g. providing information on appropriate techniques and theoretical perspectives; organising results within a conceptual framework, or devising or adapting theoretical perspectives).

Increasing responsibility for the direction and progress of the research would be expected to relate to the increased responsibility and control over personal practice which is associated with enhanced metacognition. Thus, it would be expected that one measure of the process of change is the progressive acceptance of certain of these responsibilities by the teachers.

The above assertions will now be considered in terms of findings from the various contexts of Presentations 2-4.

NOTE

1 Two points about this latter position should be made here. First, a pluralistic, relativist position characterises the very nature of constructivism. Second, it is important that those of us who advocate constructivism hold to this position when interpreting data and

advancing implications for teaching and learning. Maintaining absolutist ideas and beliefs about, say, desirable ways to facilitate personal change is incompatible with constructivist principles.

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